



TAHOE IN DEPTH

Protecting, Enjoying & Exploring the Lake Tahoe Basin

Summer 2015 ■ Issue #6

DROUGHT POSES WILDFIRE RISK



A plume of smoke from the 2007 Washoe Fire on the West Shore of Tahoe was clearly visible from the South Shore.

By Tom Lotshaw

TAHOE REGIONAL PLANNING AGENCY

The severe drought gripping California and Nevada for three, going on four years has left Lake Tahoe with low water levels, extensive sand beaches, drier than usual forest conditions, and an elevated risk of wildfire.

A small wildfire in March was the

year's first at Lake Tahoe. It was caused by an illegal campfire in Desolation Wilderness, a popular backpacking area where campfires have been banned since 1990. Campfires are responsible for about 90 percent of the wildfires each year on National Forest System Land around the Lake Tahoe Basin.

"It caught two rather large logs on fire

and threatened the surrounding forest, and normally people wouldn't even be out there that time of year," said John Washington, fuels division chief for the U.S. Forest Service Lake Tahoe Basin Management Unit.

People are going to have to be extra careful to prevent wildfires this year

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Lake clarity shows big improvement

By Jim Sloan

TAHOE IN DEPTH

Lake Tahoe was as clear as it's been in a decade in 2014, with the average clarity level for the year measuring 77.8 feet.

While some of the improvement might be due to unprecedented environmental improvement projects constructed in recent years, another key factor in the improved clarity was certainly the three-year drought. Less rain and snow means less urban runoff, which carries sediment into the Lake to cloud the water and fuel unnatural levels of algae growth.

"While these latest data are very reassuring, they should not be interpreted as victory in our joint restoration efforts," said Geoffrey Schladow, director of the UC Davis Tahoe Environmental Research Center. "Complete restoration is still decades away, and some of the greatest challenges still lie ahead of us."

Lake clarity is measured by lowering a white disc into the water

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It's time to prepare for wildfires

We did it again. With your support to sustain Tahoe In Depth, we won another important award. The California Association of Public Information



Officials (CAPIO) recognized Tahoe In Depth this spring with an Award of Excellence. That makes two awards in the last two years recognizing our commitment to delivering helpful information on Lake Tahoe and all it has to offer to residents and visitors.

On to what's on our minds this summer—fire danger. With a prolonged drought, record warm temps, and heavy visitorship expected this summer, the risk of wildfire is high. Please take a look at our cover story to

make sure you're prepared should another wildfire hit the Tahoe Basin.

Let's not forget that summer in Tahoe is like nowhere else on earth. As Mark Twain said, "Three months camping at Lake Tahoe would restore an Egyptian mummy to his former vigor."

If you enjoy Tahoe In Depth, turn to page 22 to show us your support. We're doing a drawing for an educational boat tour on Lake Tahoe for all new subscriptions received by July 31, so make sure to enter. Have a terrific summer.

— Julie Regan

Tahoe In Depth

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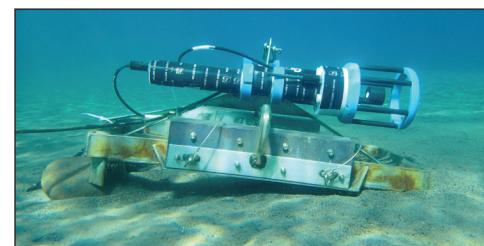
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Climate changes can throw off key wildlife patterns

By Ruby Lyon

TAHOE INSTITUTE FOR NATURAL SCIENCE

A shifting climate affects the timing of important events in the plant and animal world. These important life cycle events—known as ‘phenology’—happen when the wildflowers bloom, when plants make fruit or new leaves, or when birds migrate or build nests. The timing of these life cycle events is intricately connected to many environmental factors, including elevation and weather.

For example, a long winter with heavy precipitation will result in many phenological events happening later in the season, while a mild, dry winter, such as those in recent years, is linked to the early arrival of spring.

Some phenological processes may be responsive to weather events and therefore can react quickly as climate shifts. For example, local sparrows, robins, and bluebirds may only descend to lower elevations during the harshest winter weather, then return after a couple of mild weeks.

Migrating animals

This is not the case for many other organisms. Western tangers wintering in Central America have no idea if Tahoe is having a mild winter and an early spring. They try to get here early to secure the best territory and capitalize on the brief summer flush of resources, but if they arrive too early, they may be faced with limited food and freezing weather. Migration patterns develop over many generations, and it can take a while for these patterns to shift to match changing conditions at Lake Tahoe.

With small feet and heavy bodies, Tahoe’s mule deer are not built to cope with deep snow. To make matters worse, their principal food source gets buried. Therefore, Tahoe’s deer typically move to lower elevations for the winter, with many making the shortest trip possible by heading east. Many of Truckee’s Loyaltan herd will descend the Truckee River canyon to Verdi; others head north. The Carson Range deer have an easy migration to lower elevations, while deer in Christmas Valley and the Angora Burn area



A pair of mule deer browse in the lower elevations of the Sierra. Many deer may never have experienced a “real” Tahoe winter.

migrate up over Luther Pass to Hope Valley, and then down the Carson River.

It is not unheard of for deer to be caught by early snowfall and get trapped in the Tahoe Basin, and such animals usually are seen in the vicinity of Emerald Bay, where they spend the winter at Lake level. Quite a few deer have been seen at Tahoe mid-winter in recent years, and earlier this year a few young bucks were seen swimming off Pope Beach in February! The timing and routes of deer migrations are worked out over many generations, and are passed down culturally by older members of the herd. After four years of drought, it is safe to assume that many of the deer now overwintering at Tahoe have never experienced a “real” Tahoe winter, and have never learned to migrate away from an average Tahoe snowpack. Mule deer only live around 10 years on average, so additional mild winters may bring about a significant drop-off in the numbers of deer that know how to migrate.

Early insects

Plants seem to be more responsive than animals to warming temperatures, leafing out or flowering as soon as possible. However, danger lies in that flowers may open up before their pollinators are available.

Another challenge is that flowers are vulnerable to spring storms and frost damage. This latter issue is equally problematic for the insects that try to emerge earlier in an attempt to sync up with the plants. Many insects may not have a choice, and butterflies are a classic example. Plants develop chemical compounds to make themselves unpalatable to insects. Butterflies then evolve defenses and a tolerance to these compounds, and as a result they begin to specialize in only eating certain plants as caterpillars. Therefore, most butterflies have a fairly narrow range of options for larval host plants. If the plants are growing earlier in the season, the caterpillars must be active earlier in the season as well, and often that means the adults must fly earlier in the season to find the right plants on which to lay their eggs.

Research has shown many different adaptations to shifting climate as it relates to butterflies and their host plants. Most commonly, we see the butterflies flying earlier in the season, but emerging earlier is still a risky move in the mountains, and spring storms are always likely. Many butterfly species are shifting habitats or ranges. Some are showing disrupted migration patterns, while other species are showing more novel shifts like staying locked in their typical

timing, but shifting host plants instead. However, many species have shown a complete lack of adaptive response, falling out of sync with their host plants, and these species and populations may be disappearing.

Future monitoring

The understanding of life cycle events and their consequential effects on birds, insects, and mammals will be an important factor to monitor in the future. Anecdotal evidence is already demonstrating a shift in the behavior of Tahoe’s organisms due to unseasonably warm winters and drought conditions. A more permanent shift in our weather patterns could have effects on everything from successful gardens and ski seasons to larger-scale impacts related to food security. In response, the Tahoe Institute for Natural Science (www.tinsweb.org) has created the Sierra Seasons Project, a citizen science program monitoring Tahoe’s phenology. It is our hope that long-term observations from local school kids, hikers, and residents will result in data that can be used to determine how climate change is affecting the phenology of Tahoe.

Ruby Lyon is an outreach manager and AmeriCorps member with the Tahoe Institute for Natural Science.

Last winter was the warmest in California history

Continued from page 1

because of the exceptionally warm and dry conditions. Just how dry is it?

The California snowpack measured only 5 percent of the statewide average in April, when snowpack is normally at its greatest. In the Lake Tahoe Basin, snowpack was only 3 percent of average.

This past winter was the warmest on record in California, breaking a record set the previous winter. The year 2014 was also the warmest calendar year on record, and the third year of a severe drought that has seen the driest three consecutive years on record for statewide precipitation.

“Not only is this a California or Nevada problem, this problem extends up into Oregon, Idaho, Washington—pretty much all of the Western states are being affected by above-normal temperatures and below-normal precipitation,” said Alex Hoon, fire weather program manager for the National Weather Service in Reno.

Low precipitation and exceptionally warm weather have left California and Nevada exceptionally dry. By mid-April, dry forest conditions in the Lake Tahoe Basin resembled conditions not normally seen until mid-summer or later.

“We’re looking at some of the driest conditions we’ve seen in modern times. People need to be aware that the whole Lake Tahoe Basin is going to be under the gun for wildfire this year,” Hoon said.

Even when the drought ends, the wildfire threat will remain for many Lake Tahoe communities in the wildland-urban interface where homes, businesses, and forests meet, so people need to continue to adapt to that reality, Hoon said.

“The wildfire threat is going to continue and not go away. The Tahoe Basin will get another fire going through there someday. It’s not a question of if. It’s a question of when. It’s going to happen and it takes everybody in the community to be prepared for it.”

Government agencies and fire protection districts are working to meet hazardous-fuel reduction targets for the wildland-urban interface at

What’s a Red Flag Warning?

Red Flag Warnings alert people to conditions that could cause rapid and dramatic increases in wildfire activity. Red Flag Warnings are the highest level of alert. People should be extremely careful with any activity that involves open flames, sparks, or intense heat.

Fire Weather Watches are one level below Red Flag Warnings, but fire danger is still high. Low relative humidity, strong winds, high temperatures, dry fuels, and the possibility of dry lightning can trigger Fire Weather Watches or Red Flag Warnings.



What’s causing the drought?

For three years, a high pressure system has formed west of California and knocked its usual string of winter storms off course to Canada and Alaska. The storms get caught in the jet stream and then dump snowstorms onto the Eastern United States, said Alex Hoon, fire weather program manager for the National Weather Service in Reno. Some researchers suspect the high pressure system is linked to climate change and warming surface water temperatures off the California and Oregon coasts.

Lake Tahoe. They are also working to help Lake Tahoe communities better prepare for wildfire.

The goal is fire-adapted communities, said Tahoe Douglas Fire Chief Ben Sharit.

Fire-adapted communities are neighborhoods in wildfire-prone areas that can survive wildfire with little or no help from firefighters. Residents in fire-adapted communities have worked to create defensible space for their homes and community, and understand when and how to evacuate when fire threatens. The precautions and actions they take reduce the risks of life and property losses during a fire, minimize damage to homes and infrastructure due to fire, and help reduce firefighting costs.

Tahoe Douglas Fire Protection District is doing street-level defensible space inspections and then following up with any properties that need improvements. It’s also holding evacuation drills and

reaching out to lodging associations and lodging properties to help them better inform the millions of visitors who come to Lake Tahoe each year about the wildfire risk and the precautions that need to be taken.

“It’s about making sure homeowners and visitors are aware of the fire hazard and the things that can cause ignitions, and making sure each resident has a plan to evacuate and to protect their homes and belongings without relying on the fire department. Because the fire department will be out fighting the fire,” Sharit said.

Fire departments also are asking people to be exceptionally vigilant reporting wildfires this season. “We want to catch them when they’re small,” Sharit said.

Tom Lotshaw is the public information officer for the Tahoe Regional Planning Agency.

One less spark, one less wildfire

Campfire safety: Before starting a campfire, make sure you have a campfire permit and that they are allowed where you are visiting. Ensure your fire is properly extinguished.

Defensible space: Make sure there is adequate defensible space around homes and businesses. Clear dead vegetation. Remove leaves and needles from gutters and yards. Trim tree branches 6 feet above the ground.

Vehicles: Never pull over in dry grass. Make sure trailer chains aren’t dragging. Maintain tire pressures to avoid driving on wheel rims and never let brake pads wear too thin.

Equipment use: Never mow or trim dry grass during Red Flag Warnings.

Other tips: Extinguish and properly dispose of cigarettes. Don’t burn debris on No-Burn Days, when it’s windy, or where it’s not allowed. Report suspicious activities to prevent arson.

Source: www.PreventWildfireCA.org

What is a fire-adapted community?

Fire-adapted communities are communities in fire-prone areas that require little assistance from firefighters during a wildfire because their residents have the knowledge and skills to prepare their homes and property to survive wildfire, evacuate early, safely, and effectively, and survive if trapped by a wildfire.

Elements of a fire-adapted community include protection features such as fuel breaks; adequate defensible space with vegetation management around structures; a built environment that resists ignition; evacuation preparedness; and good community access for people and emergency responders to get in and out.

For more information, visit www.livingwithfire.info/tahoe.

A guide for responsible dog owners

Understanding local leash laws and cleaning up after pets is key

By Victoria Ortiz

You're running on a trail through the forest when suddenly an 80-pound Rottweiler bounds onto the path not 20 feet away.

You come to a sharp stop.

"Good dog," you say in a tense but friendly voice. A few seconds later, a man strolls into view.

"Is he friendly?" you ask.

"Of course," the man says. "I wouldn't have him off leash if he wasn't."

Chances are that all of us have been on one side or both of this interaction during a hike or trail run at Lake Tahoe. Maybe you've sailed off your bike to avoid hitting a dog on the trail, or have yelled at a biker flying down the trail that nearly hit your dog.

Who's right and who's wrong? In the test of man vs. beast, who has the right of way? To help keep the peace, let's clarify some of the myths about Lake Tahoe's dog regulations.

Myth: Dogs can be off leash as long as they are under voice control.

Fact: City and county ordinances on the California side of Lake Tahoe require all dogs to be on leash. Washoe County in Nevada also has a leash law.

"In El Dorado County, there is a leash law whether you are in town or in the middle of nowhere," says Lieutenant Robert Gerat of El Dorado County Animal Services. "A dog off leash might chase wildlife, get injured, or get into a fight with another dog. Worse yet, it may bite a person or otherwise cause injury to a cyclist or pedestrian."

Public land managers such as the U.S. Forest Service and the California Tahoe Conservancy typically follow city and county ordinances. According to the U.S. Forest Service Lake Tahoe Basin Management Unit, every county in California has a 6-foot leash law that supplements federal regulations. County dog ordinances take precedence even on National Forest System land.

"Well-behaved, leashed dogs are welcome almost anywhere in the National Forest within the Lake Tahoe Basin, with the exception of



Off-leash dogs are a common sight at Tahoe. Make sure you know the rules wherever you walk your pet, and carry a leash.

designated swim beaches and areas that are restricted for wildlife protection by federal law," said Forest Service Public Affairs Officer Cheva Gabor. "County ordinances say dogs must remain on leash, even in the Desolation Wilderness, and dog owners should remember to pick up after them."

Myth: Dog poop is biodegradable, so I don't have to pick up my dog's excrement in the forest.

Fact: Dog waste contains harmful bacteria and concentrated nutrient content that are not natural to Lake Tahoe's environment. When people leave their dog's poop, it can pollute streams and lakes with nitrogen, which feeds increased algae production. Dog feces can also contain parasites such as giardia and cryptosporidium, which affect humans. When dogs poop on the snow, it freezes until the snow thaws and carries those same harmful particles into the nearest water source.

Additionally, according to the Lake Tahoe Humane Society and the Society for the Prevention of Cruelty to Animals, canine parvovirus has infected over 100 dogs in South Lake Tahoe

alone this past year with a 20 percent fatality rate. This highly contagious and virulent disease spreads through direct or indirect contact with infected dog feces. Coyotes, foxes, mountain lions, and raccoons can also become infected and spread the disease.

"By keeping your dog on a leash, you can control where they go and what they may try to eat, which is crucial in preventing the spread of parvovirus," says Lake Tahoe Humane Society Executive Director Niki Congero. "It is imperative that people pick up after their dog so that other animals don't come in contact with potentially infected feces. The only way you can protect your dog from parvovirus is to make sure they are current with their vaccinations. The parvovirus vaccine should be boosted every two to three years."

Myth: My dog doesn't kill wildlife, it just chases it.

Fact: Lake Tahoe contains critical habitat for many species, including a variety of nesting birds. The Upper Truckee Marsh is the largest remaining wetland in the Sierra Nevada and

considered by many to be the best spot for rare and migratory birds in Lake Tahoe. The California Tahoe Conservancy manages the marsh for the protection and enhancement of wildlife habitat and water quality.

"Off-leash dogs do not always stay on the trail, and often run free in sensitive areas, and that endangers wildlife," says Conservancy land steward Sarah Werrick.

To curb this behavior, the Conservancy placed a seasonal dog closure on the marsh from May 1-July 31 during the critical breeding season. Will Richardson, Tahoe Institute for Natural Sciences co-executive director, explains that many birds stop over at the marsh on their annual migration in late summer and fall.

"Migration is very difficult work, and these birds are often right on the physiological edge between life and death," Richardson says. "They don't have spare energy to play games with dogs, and folks that let their dogs flush the birds may be indirectly killing some of these birds without realizing it."

Victoria Ortiz recently left her post at the California Tahoe Conservancy to travel the world.

Region becoming a mountain biking mecca

Basin offers a wide variety of trails that appeal to riders of all abilities

By Devin Middlebrook

TAHOE REGIONAL PLANNING AGENCY

Overlooking the shores of Tahoe, hundreds of miles of trails offer stunning vistas and endless adventures. The most famous of these is the Tahoe Rim Trail, a 165-mile loop along the ridgelines of the Tahoe Basin. A number of guided hikes, events, talks, and trainings are held every summer by the Tahoe Rim Trail Association, whose mission is to maintain and enhance the trail (www.tahoerimtrail.org).

Mountain biking has seen a rise in popularity across the nation, and Tahoe is quickly becoming a destination for the mountain biking community. At the center of this growing community is the Tahoe Area Mountain Bike Association (TAMBA). This all-volunteer, nonprofit organization is dedicated to the stewardship of sustainable, multiple-use trails and to preserving access for mountain bikers through advocacy, education, and promotion of responsible trail use (www.tamba.org).

“Mountain biking is a really accessible sport that crosses all walks of life; there is nothing exclusive about it,” said Ben Fish, president of TAMBA. “And Tahoe is probably one of the best places in the world to enjoy it.”

Popular mountain bike trails along the South Shore include the U.S. Forest Service’s Corral Loop and Van Sickle Bi-State Park. In Tahoe City, Tahoe XC offers easily accessible trails for riders of all skill levels. Incline Village is home to a number of trails, including the popular Tyrolean Downhill, another popular Forest Service trail. And along the East Shore, the Flume Trail, originally built and used during the Comstock logging era, hugs the steep mountain sides offering stunning vistas and bird’s-eye views of Lake Tahoe.

The new Bijou Bike Park, located in South Lake Tahoe, is scheduled to open in the fall of 2015. This project is a collaborative effort between the City of South Lake Tahoe and the nonprofit



The Tahoe Basin offers hundreds of miles of mountain bike trails that offer vistas of the Lake.



Bijou Bike Park Association. The park will contain several different features, including a BMX track, mountain bike skills course, and pump track.

“The Bijou Bike Park can become a national model where other places around the country can look to and see how a partnership between a nonprofit and city can make a project like this

happen,” said Fish, who is also president of the Bijou Bike Park Association.

The Bijou Bike Park will serve as a hub of biking in South Lake Tahoe and connect to the planned South Tahoe Greenway, a California Tahoe Conservancy project that will serve as the backbone of the bicycle and pedestrian network in South Lake Tahoe.

Revitalized group focuses on trails and responsible use

By Devin Middlebrook

TAHOE REGIONAL PLANNING AGENCY

The Tahoe Area Mountain Biking Association was originally founded in 1988 by three local mountain bikers, and in eight years it grew into an organization with over 1,500 members. After two decades of hard work, the group began to wane, and by 2004 the organization was all but dormant.

This did not mean the need for such a group in the area had disappeared.

A new group of volunteers reformed TAMBA in 2011 in the wake of a pivotal Tahoe Trails Conference sponsored by the International Mountain Bicycling Association and the U.S. Forest Service. Since then, the group has been focused on advocacy and trail building.

“We are 100 percent volunteer run and all work different full-time jobs. We just want to make our community a better place,” said Ben Fish, president of TAMBA. “All of the money we raise goes straight to the trails.”

In 2014, more than 350 volunteers spent 3,900 hours and over 86 days rebuilding and maintaining trails around the Tahoe Basin. TAMBA also raised \$25,000 to add over 30 features to Corral Trail in South Shore, worked with the U.S. Forest Service to rebuild 4.5 miles of the Kingsbury Stinger Trail, pushed for the creation of the Bijou Bike Park, and hosted a number of rides and fundraising events.

To learn more about TAMBA, see a calendar of events, volunteer, or donate please visit www.tamba.org.

Devin Middlebrook is an environmental education specialist with the Tahoe Regional Planning Agency.

Bike Challenge highlights benefits of cycling

Riders enjoy health, economic rewards

By **Tom Lotshaw**

TAHOE REGIONAL PLANNING AGENCY

Hundreds of people took to their bikes this June for the 10th annual Lake Tahoe Bike Challenge, a friendly, two-week competition that gets people out of their cars and onto their bikes, with individuals and teams seeing who can pedal the most trips and miles.

Compared to cars, bikes have many environmental and health benefits. During last year's challenge, 323 people made 4,115 trips totaling 17,098 miles. They burned an estimated 735,200 calories by riding bikes instead of driving, and also prevented an estimated 18,430 pounds of carbon dioxide emissions and \$3,800 in fuel consumption.

"The bike challenge is a good kickoff for the bike-riding season, but we want this to continue throughout the summer and fall," said Karen Houser, of the Lake Tahoe Bicycle Coalition.

To encourage more cycling at Lake Tahoe, the Bicycle Coalition touts the

activity's environmental and health benefits, fun and social aspects, and the appeal of fresh air and exercise. The coalition is also sharing the Lake Tahoe Bikeways Map so people can find the type of bike ride they are looking for, and also see how much work is being done to improve transportation options for bicyclists in the Lake Tahoe Region. The map is the Region's most comprehensive, and it's available at tahoebike.org/where-to-ride/bike-map/.

More than 30 miles of new bike and pedestrian routes have been built at Lake Tahoe since 2010. Projects on track for completion include a bike park in South Lake Tahoe, a 3-mile bike trail from Incline Village to Sand Harbor, and water-quality improvement projects on area highways that also include bike lanes and sidewalk upgrades.

"We've got all different kinds of bike riding, from great mountain bike trails to rides around the Lake and many bike trails for people with kids. Just getting from point A to point B is getting



Sometimes cycling just simplifies everything. easier," Houser said.

Gavin Feiger, director of the Sierra Nevada Alliance, the nonprofit environmental group that has won three consecutive Lake Tahoe Bike Challenges, agrees Tahoe communities are improving their bike and pedestrian transportation infrastructure.

"A lot of people don't realize that it's getting better, so hopefully the bike challenge will get more people out

there to see the new connectivity and improvements. There's a lot of potential here and it's coming along," said Feiger, who hasn't owned a car since 2004.

"Cars are expensive, a hassle. The environmental impact and costs of driving are huge. So cost savings, environmental benefits, health benefits, and just state of mind, getting to enjoy the Tahoe environment more; those are the big things for me," Feiger said.

Bike Challenge scholarships allow Tahoe students to pursue environmental passions

The Tahoe Regional Planning Agency has raised donations each year through the Lake Tahoe Bike Challenge to run a scholarship program for students studying environmental fields. Since 2004, the program has awarded 26 scholarships totaling \$10,850. Here's a look at three students who received scholarships and what they're up to now.

Dondra Biller

South Tahoe High School, Class of '04

Biller studied earth sciences and geochemistry at the University of California, San Diego, and had several internships, spending six weeks on a research vessel in Antarctica and working for the National Oceanic and Atmospheric Administration in Seattle. Biller later completed her Ph.D in ocean sciences and marine chemistry in 2013 at the University of California, Santa Cruz.

Biller now teaches online chemistry and oceanography courses for the American Public University System and works for GE Analytical Instruments in Boulder, Colorado, as a product application specialist for water analyzers that measure organic carbon.

"By supporting young students in their goals to study the environment, TRPA is helping establish the next generation of scientists and conservationists," Biller said.



Biller

Joseph Hill

Incline High School, Class of '09

Hill studied environmental sciences at Northern Arizona University. Interest in the water-quality improvement projects at Incline Village helped Hill choose his major. After graduating, Hill worked as a seasonal park aide ranger at Bartley Ranch in Reno. He now works as an AmericaCorps member with Incline Village General Improvement District's Waste Not Program, coordinating education and outreach.

"The TRPA scholarship empowered me to study environmental sciences throughout my college career because it made me feel like I had received direct support from my Tahoe community while I gained a lot of knowledge that now aids me in protecting our watershed resources. That motivated my work in college and through to today, since I know that the community I grew up in and still live in cares about fostering well-educated and dedicated scientists in the Lake Tahoe Basin," Hill said.



Hill

Hillary Santana

South Tahoe High School, Class of '08

Santana studied biology and environmental sciences at Swarthmore College in Pennsylvania. She chose those two fields while working as a summer employee for the U.S. Forest Service Lake Tahoe Basin Management Unit (LTBMU) the summer after she graduated from high school. Santana worked for the LTBMU every summer through college to gain more experience.

A special uses permitting position opened at the LTBMU in 2012 just as Santana was graduating from college. She applied for the job and was hired.

"To this day I am incredibly proud of my job and enjoy it every day. I am very grateful to the TRPA for awarding me the scholarship back in 2008, as it proved instrumental in helping me arrive where I am. I was able to better finance my education in a field that I was passionate about," Santana said.



Santana

HAPPY TRAILS

Summer recreation abounds—around and on the Lake



A paddler strikes off across the open water of Lake Tahoe.

By Devin Middlebrook

TAHOE REGIONAL PLANNING AGENCY

Summers at Lake Tahoe are famous for blue skies, clear waters, and cool mountain breezes. Those qualities attract millions of visitors to Tahoe every summer. For locals and visitors, there are no shortages of ways to enjoy Lake Tahoe.

Kayaking and standup paddleboarding have exploded in popularity, offering a leisurely and intimate way to enjoy the outdoors. To help navigate the vast waters of Tahoe, the Lake Tahoe Water Trail offers information about public launch sites, paddle routes, shoreline businesses, cultural and natural attractions, navigation tools, and water safety.

“The Water Trail wayfinding tools provide knowledge and resources for all mariners to have a safe and fun

adventure, and to connect to our heart and soul in the most natural sense,” said Becky Bell, project manager for the Lake Tahoe Water Trail. “It helps paddlers to understand the interconnected relationship of man with nature, and to navigate and protect our pristine waters.”

The Water Trail offers seven day-trip routes that include paddle itineraries with details about parking, on-site facilities and amenities, public beach access to nearby hiking trails, restaurants, paddle shops, historic sites, lodging, and campgrounds. Water Trail maps can be purchased at www.laketahoewatertrail.org.

A growing number of standup paddleboard races and events are held at Lake Tahoe every summer. These events attract competitors and top professionals from around the world. Premier events for the summer include the Tahoe Cup

Race Series, Race the Lake of the Sky, and Ta-Hoe Nalu SUP Race.

Tahoe is famous for its secluded sandy coves, perfect for enjoying long summer days.

Some of the most popular beaches around the Lake include Sand Harbor on the East Shore, Zephyr Cove and El Dorado Beach in the south, Rubicon and Meeks Bay to the west, and Tahoe City Commons and Kings Beach on the North Shore.

Created by the Tahoe Fund, the Tahoe beach app (www.tahoepublicbeaches.com) is a great resource to discover new beaches in the area.

Area ski resorts are also working to expand their summer recreation offerings. Heavenly Mountain Resort recently moved forward with its Epic Discovery Project aimed to expand summer activities. The expanded

activities include zipline and sky cycle tree canopy tours, a mountain bike park and trails, ropes courses, and interpretive and educational tours to teach visitors about the Lake Tahoe Region’s cultural and environmental resources. The expansion of summer activities at area mountain resorts makes the outdoors more accessible to a wide range of visitors, many of whom cannot fully experience it through traditional outdoor recreation.

Whether on the waters of Tahoe or high above the shores on a trail, the possibility for summer recreation at Tahoe is only limited by the number of hours in a day and one’s drive for adventure.

Devin Middlebrook is an environmental education specialist with the Tahoe Regional Planning Agency.

Spring means it's time to tune up your property's BMPs

By Shay Navarro

TAHOE REGIONAL PLANNING AGENCY

Any homeowner knows that winter can take a toll on your property. The snow melts and leaves behind all manner of debris and damage.

But at Lake Tahoe, spring cleanup can mean more than just raking up. Tahoe properties need to have erosion-control landscaping measures known as Best Management Practices (BMPs), and spring often means tuning up your BMPs to make sure your property isn't sending polluted runoff to the Lake.

Springtime also brings the added responsibility of maintaining defensible space around your property.

BMP maintenance

BMPs are important in that they minimize the impacts of development on water quality. TRPA requires properties to capture and infiltrate water from impervious surfaces, such as roofs and driveways, and to stabilize sources of dirt and debris with vegetation and mulch. Properties in compliance receive a BMP Certificate of Completion. Just like a car cannot be driven without changing the oil, BMPs need routine maintenance in order to continue functioning properly. Routine maintenance preserves the lifespan of BMPs and minimizes the potential for polluted stormwater runoff to reach Lake Tahoe.

Single-family properties

BMP maintenance activities for a single family residential property typically include:

- Maintaining a 5-foot, noncombustible perimeter around each structure by removing dead vegetation, dried leaves, and pine needles. Keep only irrigated herbaceous vegetation in this area.
- Sweeping sediment off driveways, walkways, and patios.
- Removing pine needles, debris, and sediment from slotted channel drains, swales and gutters. Replace or repair any damaged conveyance structures.
- Removing pine needles and debris from gravel infiltration systems and rock lined swales. Remove gravel clogged with fine sediments, sift clean and replace. Repair or replace borders, filter fabric, and



Driveway gravel infiltration systems require annual maintenance to remove fine sediment from debris and road abrasives. The best way is to remove clogged gravel, sift it clean in a mesh tray over a wheelbarrow and return the clean rock back to the gravel infiltration system.



To facilitate maintenance, sediment traps for driveway gravel infiltration systems collect sediment in the trap before it flows into and clogs the gravel.

sediment traps as needed.

- Replacing dead vegetation in infiltration swales and basins and adding 1-2 inches of mulch to insulate plant roots and conserve moisture.
- Maintaining a minimum 3-inch layer of rock armor under roof drip lines and decks.
- Stabilizing any exposed bare soil and stabilize slopes with visible signs of erosion using rock mulch and/or vegetation.
- Repairing any failing retaining

structures and removing accumulated sediment to achieve 6 inches of space from the top of the structure.

- Maintaining parking barriers to block vehicle access to all unpaved areas.

Commercial, apartments

Commercial and large multi-family residential properties complete online inspection and maintenance logs to show that BMPs have been maintained. BMP maintenance on these properties is critical in preventing polluted

stormwater runoff from reaching Lake Tahoe and helps local jurisdictions meet Total Maximum Daily Load (TMDL) requirements. Once maintenance is verified, TRPA will re-issue the BMP Certificate of Completion.

For more information on BMP maintenance requirements and to view step-by-step instructional maintenance videos, visit tahoebmp.org.

Shay Navarro is the stormwater program manager at the Tahoe Regional Planning Agency.

Famous first sightings *Sometimes, first glimpses of Tahoe become historic*

By David C. Antonucci

Journals, letters, postcards, and now Internet postings continue to record the impressions of visitors getting their first breathtaking view of Lake Tahoe. Perhaps the most significant and moving among these impressions were the discovery of the Lake by an explorer, the first visit to the Lake by early Euro-American travelers, and the vibrant recollections of Tahoe by an iconoclastic 19th century American author.

John Fremont discovers Lake Tahoe

On Feb. 14, 1844, western explorer John Fremont and his cartographer scrambled from their Hope Valley campsite to the summit of Red Lake Peak to take in the view. They were in a desperate search for a clear path through the snowbound Sierra Nevada. Through the narrow, fog-shrouded canyon of the Upper Truckee River, Fremont saw “a beautiful view of a mountain lake at our feet...” Back at camp, Fremont dutifully entered these words into his journal; he was the first Euro-American to record the sighting of Lake Tahoe.

Like many who came later, Fremont experienced the soothing beauty of Lake Tahoe and drew from it the emotional perseverance to confront the challenges ahead. Years afterward, he recalled the comforting moment of discovery: “For a long time we sat enjoying the view, for we had become fatigued with the mountains and the free expanse of moving waves was very grateful. It was like a gem in the mountains...”

The two explorers saw a mountain paradise safely secluded from the outside world and in harmony with its Native American inhabitants.

Go find it

To reach Fremont's viewpoint on the summit of Red Lake Peak, park in one of the public lots just west of Carson Pass on Highway 88. This beginner to intermediate trail starts on the north side of the highway in the Sno-Park lot. Follow the ridge line while heading steadily north for about 1.5 miles.



Near the end of an 11-mile hike from Carson City, 25-year-old Samuel Clemens got his first glimpse of Lake Tahoe when he emerged from the forest near Tunnel Creek. He would later recall the experience when he wrote “Roughing It” under the pseudonym of Mark Twain.

Mark Twain moved by Tahoe visage

In Sept. 1861, 25-year-old Sam Clemens and a friend hiked a punishing 11.7-mile route over rough roads and trails from Carson City to Lake Tahoe to establish a timber claim near modern-day Tahoe Vista. Exhausted from the strenuous hike, the view that suddenly appeared as they emerged from the forest along Tunnel Creek was both stunning and emotional. It is here that Clemens for the first time absorbed the visual magic of Lake Tahoe.

At an altitude of almost 1,000 feet above the Lake, the men had a commanding view of Lake Tahoe. The view was so awe-inspiring and breathtaking that it indelibly etched Clemens' imagination and memory with its vividness and emotion. Ten years later, writing as Mark Twain, he recalled the magical moment in “Roughing It.”

“...at last the lake burst upon us, a noble sheet of blue water lifted six thousand three hundred feet above the level of the sea, and walled in by a rim of snow-clad mountain peaks that towered aloft full three thousand feet higher still! ... As it lay there with the shadows of the mountains brilliantly photographed upon its still surface I thought it must surely

be the fairest picture the whole earth affords.”

Mark Twain's word painting of the view became the most frequently quoted description of Lake Tahoe and still finds relevance over 150 years later.

Go find it

Bike to or park where legal on Highway 28 near Tunnel Creek Café in Incline Village. Starting on foot or bike near the café, follow the unpaved Tunnel Creek Road uphill 1.8 miles to the Fairest Picture Vista Point. At the vista point, there is a new interpretive panel and bench sponsored by the Incline Village-Crystal Bay Historical Society and Tunnel Creek Lodge. A \$1 per hiker and \$2 per biker admission fee applies for entry into Lake Tahoe Nevada State Park at Tunnel Creek Road.

Westward bound pioneers detour through Tahoe

In the wake of Fremont's 1844 brush with Lake Tahoe, a party of emigrants was ascending the Sierra Nevada through the Truckee River canyon. A splinter group of six horse-mounted pioneers followed the Truckee River to its source at Lake Tahoe and then over a pass on the West Shore to Sutter's Fort in



Photos by David C. Antonucci

The North Shore near where a party of horse riders became the first Euro-Americans to reach the shoreline of Lake Tahoe.

the Sacramento Valley.

In a letter, Angeline Morrison, a member of the equestrian party, recounted the group's entry into the Lake Tahoe Basin around Nov. 16, 1844. It was the first recorded visit to Lake Tahoe by Euro-Americans.

“... We came out on the shores of a magnificent lake, verily an ocean, as blue as a sapphire in a setting of mountains. We could not see the end of it, but the water itself was as clear as glass. We crossed along the northern end of it, feeling such a medley of emotions as my pen is feeble to describe; such awe and wonder at this marvel...”

Morrison and her companions would be the first of many millions of visitors to stop over at Lake Tahoe, a procession of tourists who continue to this day.

Go find it

In Tahoe City, start in the Gatekeeper's Museum parking lot, just south of the Truckee River on Highway 89. Walk through William B. Layton Park to the shoreline of Lake Tahoe. Here you will be in close proximity to where the pioneers first stepped foot into the Lake Tahoe Basin and viewed the “magnificent lake.” Visit the museum located on the grounds to learn more about Lake Tahoe's colorful history.

First sightings of Lake Tahoe by new visitors continue to amaze, move, and inspire, leaving them infused with a deeply felt and unforgettable memory of the unique natural beauty that is Tahoe.

David C. Antonucci is the author of “Fairest Picture – Mark Twain at Lake Tahoe,” from which much of this material is drawn.

Green Bucks program helps support environment

Businesses partner with Tahoe Fund, Watershed Council to raise money for projects

By Amy Berry

TAHOE FUND

The Green Bucks program, which allows Tahoe residents and visitors to make small contributions while paying their hotel or restaurant bill or buying lift tickets, has already raised more than \$100,000 to help support new hiking and biking trails, watershed restoration projects, wildlife protection, and other environmental stewardship programs.

Businesses around the Region have partnered with the Tahoe Fund and the Truckee River Watershed Council to collect dollar donations from their guests through the program.

Green Bucks is based on popular dollar-donation programs used across the country to help raise funds for great causes. The concept is simple: businesses add a dollar donation onto major items like hotel rooms, ski tickets, golf rounds, or meals.

One of those businesses is the new Hard Rock Hotel & Casino Lake Tahoe.

"Hard Rock Hotel & Casino Lake Tahoe is fortunate to have one of the world's most beautiful and picturesque backdrops for our new resort casino," Hard Rock Vice President and General Manager Chris Fiumara said.



Chuck Scharer and Bobby King of Edgewood Tahoe present a check from Green Bucks donations to Tahoe Fund CEO Amy Berry and Tahoe Fund Board Member Pete Sonntag on the iconic 18th green of the Edgewood Tahoe course.

"Participating in the Green Bucks program is just one way we can help in preserving this natural treasure for generations to come."

Some of the projects supported by the organizations include the Van-Sickle Bi-State Park, the Lakeside Bike

Trail in Tahoe City, the Rabe Meadow Bike Trail in Stateline, improvements at Sand Harbor State Park, and a new environmental stewardship campaign called Take Care.

To aid in efforts to restore and preserve the Tahoe Region, please

consider visiting one of the participating Green Bucks businesses:

Big Blue Adventure LLC
Blue Angel Cafe
Drunken Monkey
Edgewood Tahoe
EventMasters
Fifty/Fifty Brewing Company
Hard Rock Hotel & Casino Lake Tahoe
Heavenly Mountain Resort
Homewood Mountain Resort
Kirkwood Mountain Resort
Lakeside Inn
Lake Tahoe Resort Hotel
MontBleu Resort Casino
Mourelatos Lakeshore Resort
Northstar California
PlumpJack Squaw Valley Inn
Squaw Valley|Alpine Meadows
Squaw Valley Lodge
Tahoe Mountain Properties
Tahoe Mountain Resorts Lodging
Tahoe South
Truckee Tahoe Airport
Truckee Properties
West Shore Café
WinterWonderGrass

To learn more, visit tahoefund.org or truckeeriverwc.org.

Tahoe clarity showed deep improvement in 2014

Continued from page 1

and measuring the point at which the disc disappears from the naked eye. Researchers take 28 readings throughout the year. In 2014, the best recorded clarity depth was 93.5—within 10 feet of the 102-foot depths recorded nearly 50 years ago and a benchmark for clarity-restoration efforts.

Researchers at the Lake continue to study what influences the remarkable clarity of Tahoe, and in recent years, their attention has turned from the offshore, deep-water state of the Lake to the conditions of its shoreline or nearshore environment. While the deep water appears to be improving, the

nearshore continues to be subject to the fickle effects of drought, climate change, and invasive species, which threaten to disrupt the natural balance of the Lake.

Tahoe, the second deepest lake in the country behind Crater Lake in Oregon, is considered rare because in its natural state, very little algae-fueling sediment washes into the water. Historically, this has allowed the Lake to remain remarkably clear.

In recent generations, development, a warming climate, and atmospheric deposition from various sources has disrupted Tahoe's natural state, causing it to lose its transparency.

The historic low for clarity was registered in 1997, when the average

was measured at 64 feet.

The 2014 average reading was a 7.6-foot improvement over 2013. Winter clarity improved as well.

The Tahoe Regional Planning Agency manages the multi-jurisdictional Lake Tahoe Environmental Improvement Program to repair past damage to the ecosystem.

That program has resulted in substantial public and private investment in projects to improve water quality and other environmental indicators at Lake Tahoe. Among the hundreds of measurements TRPA tracks, mid-lake clarity is a key indicator of whether restoration programs are working.

"Even considering the impact of reduced runoff from the 4-year drought, these findings show that our collaborative efforts to reduce erosion and stormwater pollution in the Lake Tahoe Basin are working and have halted the decline in mid-lake water clarity," said Joanne S. Marchetta, executive director of the Tahoe Regional Planning Agency.

"Still troubling, however, is the fact that Lake Tahoe's nearshore waters are experiencing problems with reduced clarity, algae growth, and invasive species. We must remain vigilant in our pursuit of the Lake's restoration."

Nearshore Pollution

People come from all over the world to visit Lake Tahoe and marvel at the beauty and clarity of the shoreline water. But managing the nearshore environment is a complex challenge. This illustration depicts the key pollutants, and their sources and effects on the nearshore. Uncontrollable factors, such as climate; lake circulation and mixing patterns; water temperature; and the shape, depth, and form of the nearshore also influence its condition.

Sediments & Nutrients

Sediments suspended in water scatter and refract light, making it appear murky. Smaller sediment particles have greater scattering power and are extremely difficult to settle once they are in the water column. Nutrients are a natural part of the ecosystem, acting like fertilizers to support the growth of algae and aquatic plants that provide food and habitat for fish, shellfish, and smaller organisms that live in water. However, too many nutrients degrade water quality by stimulating excessive growth of algae and aquatic invasive plants and animals. Sediments and nutrients are derived from urban, forest and stream, and atmospheric sources.

URBAN SOURCES

Roads are the largest specific source of urban pollutants. Vehicles grind roads, wintertime traction sands and accumulated sediments into fine particles. Roads (1) parking lots (2) and driveways (3) are impervious surfaces that prevent precipitation from soaking into the ground. Fine sediment and nutrients are carried in stormwater runoff through the storm drain network (4) to the lake or tributary streams. Bare soils on parcels or construction sites (5) also wash into the storm drain network. Fertilized turf (6), leaking sanitary sewer pipes and remnant septic systems (7) may also serve as a source of nutrients.

FOREST & STREAM SOURCES

Erosion of stream banks and beds (8) occurs where channels have been disturbed or straightened, or where the channel has become disconnected from its floodplain. If left unmitigated, disturbed soils such as dirt roads (9), ski runs (10) and burned areas (11) can deliver sediments and nutrients in runoff.

ATMOSPHERIC SOURCES

While a significant proportion of airborne pollutants originate outside the Lake Tahoe Basin (12), most are generated in-basin. Dust is kicked into the air by vehicles travelling on paved (13) and unpaved (14) roads and parking lots (2). Ash from wildfires (15), prescribed fire and residential woodstove smoke (16) contributes particulate matter and nutrients. Emissions from vehicles (17), boats (18) and other motorized machinery are the primary source of nitrogen.

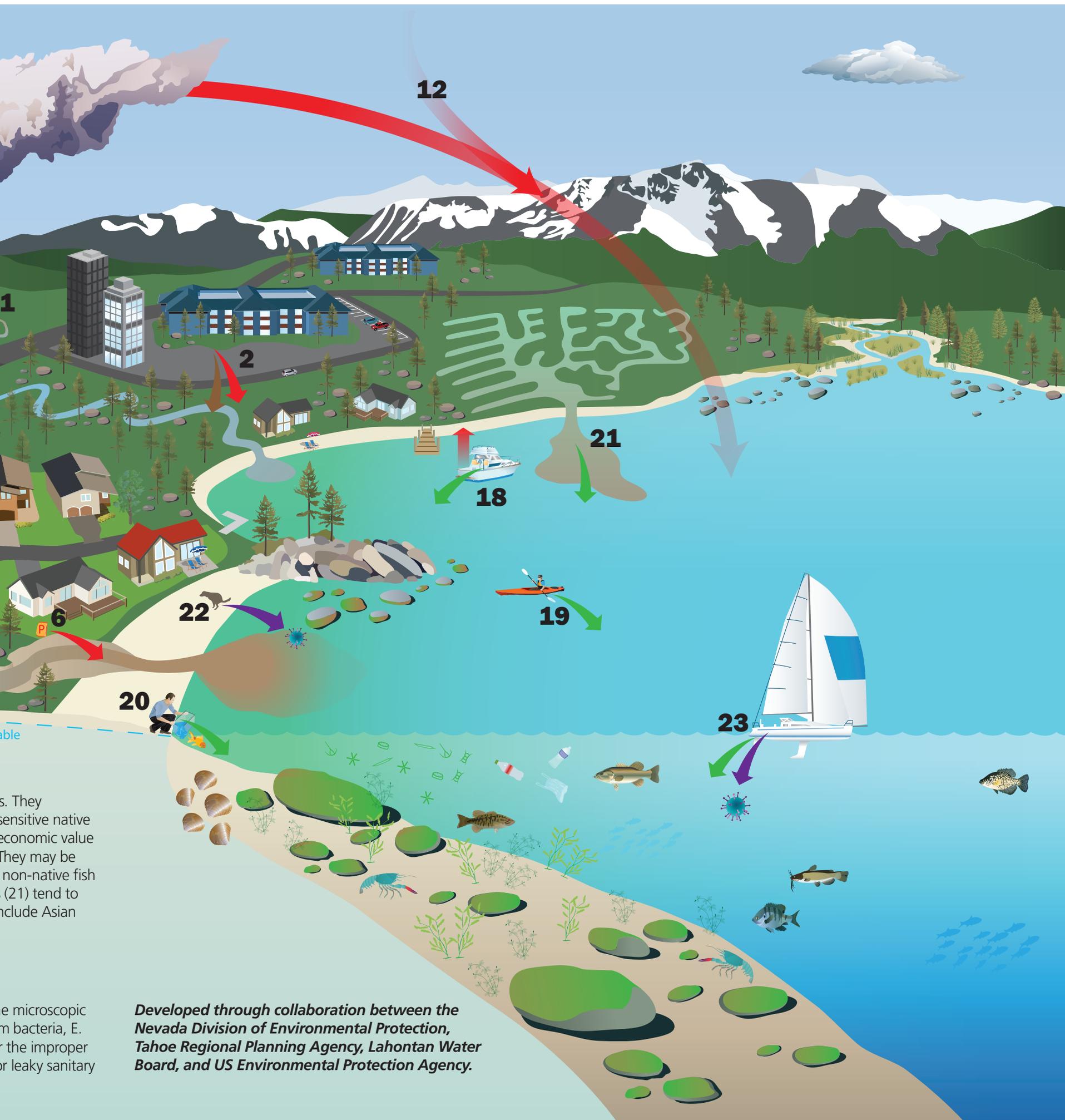


Aquatic Invasive Species

Aquatic Invasive Species (AIS) are non-native plants and animals that negatively impact water resources. AIS generally reproduce, grow, adapt to and recover from environmental change more rapidly than more sensitive species. AIS reduce the diversity of life, damage habitat, and decrease the aesthetic, recreational, and economic value of waters they invade. AIS are primarily spread by motorized (18) and non-motorized (19) watercraft. They are carried in the bilge water of boats, or attached to the watercraft. People have purposefully introduced AIS for sport fishing and naively by dumping aquariums (20). The Tahoe Keys and other protected marinas serve as AIS havens due to the more suitable habitat conditions they afford. AIS found in Lake Tahoe include clam, curlyleaf pondweed, Eurasian watermilfoil, bluegill, bass, goldfish, and crayfish.

Harmful Microorganisms

Microscopic organisms are a natural part of the ecosystem. However, in great enough quantities, some organisms may make people sick when ingested. Examples of harmful microorganisms include coliform bacteria, E. coli, and cryptosporidium. Harmful microorganisms stem from feces derived from wildlife, pets (22) or the disposal of human waste (23). They may also be leached to the lake through remnant septic systems or sewer pipes (7).



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Developed through collaboration between the Nevada Division of Environmental Protection, Tahoe Regional Planning Agency, Lahontan Water Board, and US Environmental Protection Agency.

Nearshore Network keeping tabs on Tahoe

New system of submerged monitors will make the Lake one of the “smartest” in the world

By Geoff Schladow

UC DAVIS, TAHOE ENVIRONMENTAL RESEARCH CENTER

A new network of offshore data-collection stations placed around Lake Tahoe is helping scientists better understand the changing environment of the nearshore area.

Six of the underwater stations have been placed around the edges of the Lake in both Nevada and California since August, and scientists hope to add 14 more. The 20-station network will include data collectors every 3 to 4 miles along the shoreline, making Lake Tahoe the best instrumented and “smartest” lake in the world.

The stations provide instantaneous data on wave height, water temperature, algae concentrations, turbidity, and other water-quality parameters. Dissolved oxygen sensors are also being added this summer. Underwater cables provide power to the stations and allow researchers and the public to access the data on the Internet.

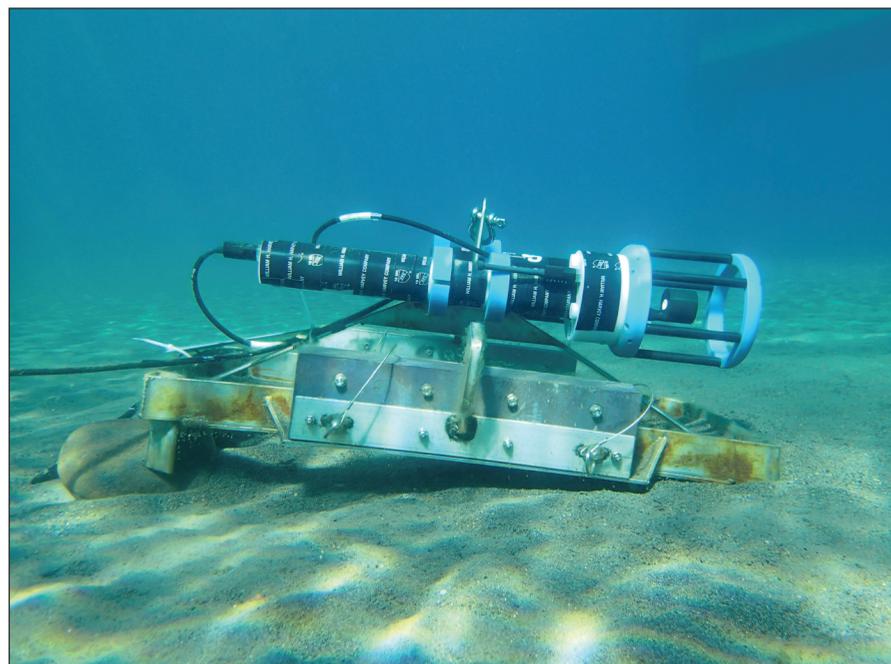
The project, dubbed the Nearshore Network, is being developed by the UC Davis Tahoe Environmental Research Center (TERC) with support

from private donors, lakefront property owners, homeowners associations, state agencies, and instrument manufacturers. The National Science Foundation is also providing graduate student support for the next three years.

The nearshore of Lake Tahoe faces sudden, erratic changes in water quality due to storms, inflows from streams and storm drains, local erosion, or drift from other parts of the Lake. The Nearshore Network will help determine what causes the degradation as well as the best way to prevent it. Tahoe already has a network of mid-lake buoys, and researchers now will be able to compare evolving nearshore conditions with conditions at the center of the Lake.

The data showed that during a Dec. 11 windstorm, 5-foot waves crashed along the North Shore, increasing turbidity and releasing organic material from the sediments. At the same time in the calm of Rubicon Bay, water from 700 feet deep in the Lake was coming to the surface, bringing with it the nutrients that fuel algal growth on the rocks surrounding the Lake.

Exhibits at TERC’s Tahoe Science Center in Incline Village will soon be showing



One of underwater stations being used to monitor nearshore water conditions.

real-time displays of the nearshore data, along with high-resolution camera views of the nearshore. A citizen science phone app is also being developed to allow everybody to participate in the data gathering.

Individuals, businesses, or homeowners

associations that want to contribute to this community-based approach to restoring nearshore water quality should contact TERC director Dr. Geoff Schladow at gsladow@ucdavis.edu.

Dr. Geoff Schladow is the director of the Tahoe Environmental Research Center.

Scientists worried about alarming loss of tiny creatures

By Jim Sloan

TAHOE IN DEPTH

Most of the changes to Lake Tahoe are clearly visible in the shoreline—increased turbidity, or invasive weeds, or algae attached to shoreline rocks.

But one of the most alarming changes is the disappearance of tiny stoneflies, worms, and bottom shrimp. These native creatures, including water mites, the blind amphipod, and the Tahoe flatworm, are barely visible, but with their numbers dropping at an 80 to 99 percent rate, researchers worry they may disappear altogether one day.

“It’s absolutely dramatic,” said Sudeep Chandra, a freshwater scientist from the University of Nevada, Reno, who noticed the decline in the native invertebrate populations while doing routine bottom

sampling at Lake Tahoe. The animals were first measured in the 1960s, and the staggering decline in their numbers since then was largely unexpected.

“Although we knew things had changed in the Lake since the last sampling event, we could have never imagined the magnitude at which these declines have occurred,” said Annie Caires, an invertebrate specialist in Chandra’s lab.

Although the animals are small, their disappearance could have a big impact on the water quality of Lake Tahoe. Without the creatures, the Lake could lose its ability to process certain nutrients.

Scientists suspect the decline in macroinvertebrate populations in Lake Tahoe could be the result of their food supply disappearing—either because the aquatic plants can’t grow due to a loss of water clarity in the nearshore or

because crayfish, an invasive species in the Lake, are eating that food supply. Chandra said it’s likely a combination of both those factors.

The creatures depend on bottom plants known as skunkweed and moss, and crayfish, which number up to 300 million in the Lake, also like to graze on those plants. Bottom plants may not be as abundant as they were 50 years ago, when the macroinvertebrate populations were first measured.

The loss could also be occurring with four new species of 1-millimeter animals called copepods recently discovered in Tahoe.

Volunteer divers working with Chandra completed an unprecedented circumnavigation of the Lake last October to collect samples to help study the disappearing creatures. Over the



The disappearance of small invertebrates, like the tiny stonefly from Lake Tahoe has some scientists concerned.

course of two months, divers collected data and samples for Chandra while being towed around the Lake at 3 mph in 15 to 20 feet of water. The absence of skunkweed was noticeable in places.

“It looks like clarity is beginning to stabilize, but the bottom of the Lake continues to change at a dramatic rate,” Chandra said.



Cave Rock open despite low water

Although Sand Harbor's boat ramp is closed this summer due to low water, the Nevada Division of State Parks has plenty to offer boaters and non-boaters alike.

The Cave Rock facility of Lake Tahoe Nevada State Park offers one of the only public boat launches accessible during low-water conditions. But the facility, situated on just 3.5 acres, offers a limited number of parking spaces, and boaters should anticipate increased demand and longer lines on busy weekends.

Boaters planning to use the facility can check ahead to find out if the parking lot is full—real time updates for parking availability and launch conditions will be available via social media outlets and tahoeboatinspections.com.

Even with the Sand Harbor boat launch closed, recreationists still have excellent opportunities to get out on the Lake. Sand Harbor offers a great spot to launch a day-long kayak adventure, or rent a paddleboard to explore the scenic shoreline.

Sand Harbor also offers opportunities to explore the visitor center, browse through the gift shop, and grab a bite to eat at the Sand Harbor Bar and Grill. Another way to enjoy Sand Harbor—and avoid the midday crowds—is to get a later start to the day, arriving at the park in the afternoon to play on the beach. Then enjoy a summer evening Shakespeare production in Sand Harbor's natural amphitheater.

Boat inspection station moves

The boat inspection station previously at Northstar has moved to 10183 Airport Road in Truckee. It will be open Thursday through Sunday. For more information: www.tahoeboatinspections.com

Sand Harbor getting a makeover



An early morning aerial photo of Sand Harbor taken from a camera-equipped drone flight.

Popular state park on East Shore getting new kiosk, comfort stations

By Staff

NEVADA DIVISION OF STATE PARKS

Nevada Division of State Park's 55-acre Sand Harbor facility will be getting a facelift again this summer as the state works to better accommodate the more than 1 million visitors a year who flock to the East Shore attraction.

This summer, work crews will begin a \$3 million, multi-year project to replace all of the park's eight restroom facilities. The work this summer will replace three of those "comfort station" facilities at a cost of \$850,000, which is being covered by a combination of funding sources—including Nevada Lake Tahoe bonds and grants from the federal Land and Water Conservation Fund.

Park officials are also installing a new self-pay kiosk at the entrance to the park. The kiosk is expected to cut down on the long wait many visitors face getting into the park during peak summertime

periods. Vehicles entering the park often create long lines that snake out onto State Route 28 and make for hazardous traffic conditions and frustrated motorists. More than 500,000 vehicles enter Sand Harbor during the summer months.

The improvements for 2015 come on the heels of two major projects completed last year at the park.

One project involved the reconstruction of the three overlooks at the Main Beach. Originally constructed in the 1980s, the overlooks were in severe disrepair due to the effects of erosion and alpine weather. The project was a collaboratively funded effort—through the Nevada Lake Tahoe bonds, the Nevada Lake Tahoe License Plate Program, Recreation Trails Program, and the Tahoe Fund—and provides three new access points that connect the parking area to the beach and eliminate erosion issues along the sandy bluffs.

The newly designed overlooks provide

ambulatory and code-compliant access to facilitate views of the beach and Lake Tahoe, and a new ADA accessible path improves access to the shores of Tahoe itself.

The second project involved improvements to the popular Sand Harbor boat launch. Last summer's drought conditions uncovered a potential environmental and safety hazard: boaters backing into the water were backing off of the end of the ramp and getting launch vehicles stuck on the concrete drop off.

In response, the park implemented a retrofit that allows vehicle wheels to safely roll off the end of the ramp—and then roll back onto the ramp and out of the water. This project was funded with Nevada Lake Tahoe License Plate and U.S. Fish and Wildlife and Nevada Department of Wildlife boating access funds.

Utility districts enact water restrictions

Conservation required to maintain municipal water supplies in the Tahoe Basin

By Kurt Althof

TAHOE CITY PUBLIC UTILITY DISTRICT

Tahoe may be one of the deepest lakes in the world, but residents and visitors are facing the same drought-caused water shortages as the rest of the West.

On the California side of the Lake, that means residents and visitors need to adhere to the 25 percent reduction in water use ordered earlier this year for the state by Gov. Jerry Brown.

The reason is simple: Most drinking water in the Tahoe Basin comes from deep water wells. The recent three-year drought has pushed their water levels to below average, making it imperative that residents and visitors conserve supplies.

For residents, that might mean pulling up lawns and replacing them with drought-resistant native vegetation. For tourists, it might mean re-using your hotel towels to cut down on water going to laundry services. For everyone, it means shorter showers, unwashed cars, and smarter irrigation.

How bad is the drought?

The year 2014 ranked as the third driest year on record for statewide precipitation, and 2012-2014 was the driest three-year period in state history. Meanwhile, California has endured record-setting statewide high average temperatures.

In the Sierra Nevada on April 1, the end of the traditional water year for the state, there was no measureable snowpack in many locations in the range, and overall the snowpack was just 5 percent of average. In the Lake Tahoe Basin, snowpack was only 3 percent of average.

Brown's mandatory water restrictions are expected to save 1.5 million acre-feet of water over the next nine months.

"We're in a new era," Brown said. "The idea of your nice little green grass getting lots of water every day, that's going to be a thing of the past."

Violators could face a variety of penalties. Last year, state regulators authorized cities to levy \$500 fines to water wasters, but most municipalities



The low water levels at Tahoe City this spring made it clear that Basin residents need to conserve water this summer.

and utilities prefer to educate water users rather than fine them. On its website, the South Tahoe Public Utility District (STPUD) warns that failure to comply with watering restrictions may result in a fine. Tahoe City Public Utility District's (TCPUD) penalty structure calls for a written warning for the first violation, with a one-time fine of \$100 for the second violation, \$250 for the third notice, and then \$500 per day for a fourth notice. That \$500 fine may also involve having the offender's water shut off.

What you can do

While some communities can stretch their water by using treated effluent for irrigation, strict environmental rules in the Basin limit those options. Still, there are other ways to make a water-saving impact. For instance, you can:

- Significantly reduce all outdoor water use in general.
- Remove or refrain from planting non-native vegetation.
- Remove lawns and replace with drought-friendly landscaping.
- Install smart irrigation systems and sensors to help reduce overwatering (check with your local water provider for

rebate programs).

- Replace appliances and toilets with new low-flow options (check with your local water provider for rebate programs).
- Install drip or micro-spray systems for irrigation.
- Limit car washing; always use an automatic shut-off hose nozzle.

Plans for South Shore residents

The South Tahoe district, which manages 16 wells for its 14,000 water customers, offers rebates for water-efficient appliances but will also help homeowners detect leaks and fine-tune their irrigation system.

STPUD also runs a turf buy-back program, offering a rebate of \$1.50 per square foot of turf replaced, with a maximum rebate of \$3,000. The program requires that a minimum of 400 square feet of turf be replaced.

The utility notes that water use in South Lake Tahoe typically triples in the summertime, with most of the use going to landscape irrigation. The utility's stage 1 water restrictions, which are mandatory and may be enforced with fines, require that users:

- Do not allow water to flow over the

ground surface or from sprinklers onto surfaces that are not able to absorb water, or on neighboring properties.

- Repair all leaks in plumbing and irrigation systems.
- Never irrigate nonlandscaped, natural vegetation or undeveloped property.
- Always use an automatic shut-off nozzle on hoses. Continuous discharge from a hose is prohibited.
- Never wash sidewalks, driveways, parking areas, tennis courts, decks, patios, or other improved areas.
- Report all signs of water leaks or water waste to the district.
- Adhere to designated irrigation days. That means STPUD and TCPUD customers with even-numbered street addresses water on Monday, Wednesday, and Friday, and odd-numbered street addresses water on Sunday, Tuesday, and Thursday. No landscape irrigation is allowed on Saturday. Drip irrigation and hand-watering with an automatic shut-off nozzle are exempt from the designated water days.

Kurt Althof is the grants and community information administrator for the Tahoe City Public Utility District.

Tahoe RCD spearheads weed removal

Conservation district takes aim at a 3-mile stretch of Truckee River

By **Nicole Cartwright**

TAHOE RESOURCE CONSERVATION DISTRICT

Divers have removed 427 cubic feet of invasive weeds from the Truckee River at the Tahoe City Dam to Alpine Meadows Road.

The work is part of the Tahoe Resource Conservation District's (Tahoe RCD) pioneering project to control the aquatic invasive plant Eurasian watermilfoil (*Myriophyllum spicatum*), which has been growing prolifically since the late 1990s, and likely entered the Truckee River following the overflow of the dam in 1997.

Tahoe RCD is coordinating the work

in partnership with the California Department of Parks and Recreation and the Tahoe Regional Planning Agency.

The project focuses on a 3-mile stretch of river through a combination of pulling the weeds out by hand and installing light-blocking bottom barriers that kill the aquatic plant. Aquatic invasive plants have established over 15 percent of the river bed upstream from Alpine Meadows Road.

The work continues this summer and fall with goals of restoring natural habitat, improving water quality, and enhancing everyone's enjoyment of the river. Due to the complexity of this project, controlling the weed from

this stretch of river is expected to take several years. Similar efforts have succeeded in eliminating Eurasian watermilfoil from infested sections of Emerald Bay.

This project also includes a comprehensive invasive weed survey of the Truckee River from River Ranch to Pyramid Lake. Funding has been provided by the Community Foundation of Western Nevada's Truckee River Fund, California Department of Parks and Recreation, and the Tahoe Fund.

Nicole Cartwright is the aquatic invasive species program coordinator for the Tahoe Resource Conservation District.



One worker uses snorkeling gear to pull Eurasian watermilfoil by hand (left) while another worker stands downstream with a net to snare any broken pieces of the weed. Later, the same site (right) is free of the invasive plant.

Boat inspection funding sought from CA and NV

Federal funding that has covered about half of the boat inspection program's annual operating costs is running out after 2015, so TRPA is working to secure additional funding from California and Nevada to ensure Lake protections continue.

A \$200,000 grant from the Quagga and Zebra Mussel Infestation Prevention Program run by California State Parks Division of Boating and Waterways will help pay for the boat inspection station at Alpine Meadows, one of four summer stations TRPA operates with the Tahoe Resource Conservation District and other partners.

TRPA's request for \$375,000 in additional funding from each state for the inspection program was in the budget proposals from Nevada Gov. Brian Sandoval and California Gov. Jerry Brown. If approved, the funds would fully offset the loss of about \$750,000 in federal funding.

In related news, TRPA is hosting the Western Regional Panel on Aquatic Nuisance Species' annual meeting Sept. 2-4 at the Lake Tahoe Resort Hotel.

Representatives from dozens of organizations that run aquatic invasive species prevention and control programs throughout the West will attend the meeting, which is also open to the public. The first two days will include presentations about aquatic invasive species prevention and control programs at Lake Tahoe and other waterbodies throughout the United States.

More info: fws.gov/answest/meetings.html and tahoeboatinspections.com.

Study finds Lake Tahoe susceptible to quagga mussel invasion

By **Tom Lotshaw**

TAHOE REGIONAL PLANNING AGENCY

A new study released this year by the University of Nevada, Reno and the Desert Research Institute found that invasive quagga mussels, if introduced, could establish themselves in Lake Tahoe.

The hope was that quagga mussels, which are native to Ukraine but have infested many American lakes and rivers, would struggle to survive in Lake Tahoe because of its low-calcium waters. But the study showed that

quagga mussels could indeed survive, particularly in areas with elevated calcium levels from already-established Asian clam populations and in areas of higher algae growth, as found along the shoreline of the Lake.

Researchers found about 80 percent or more of adult quaggas could survive over a 90-day period in Lake Tahoe's low-calcium water. Survival rates increased to more than 90 percent for adult quaggas and 60 percent for juvenile quaggas in water with the increased calcium concentrations

found near Asian clam beds—long enough for adult quaggas to start their reproductive cycles and for juvenile quaggas to grow into reproducing adults.

Why are quagga mussels a concern? The mussels are prolific breeders that can form sprawling colonies that carpet lake bottoms, boats, and other structures, littering beaches with shells and causing major environmental, scenic, and recreation damage.

Fortunately, quagga mussels have not been introduced to Lake Tahoe.

Boats inadvertently carrying quagga mussels here from other infested water bodies have been intercepted by the mandatory boat inspection program Tahoe Regional Planning Agency and 40 public and private partners launched in 2009 to help prevent the introduction of aquatic invasive species.

Now recognized as a model for the rest of the country, the boat inspection program has overseen the certification and safe launch of nearly 200,000 boats at Lake Tahoe.

Beach clean-up brings insight

Volunteers pick up thousands of pounds of waste—and cigarette butts

By Jesse Patterson

LEAGUE TO SAVE LAKE TAHOE

Hundreds of volunteers donned sunscreen and work gloves last year to comb Tahoe's waterfront and beaches collecting trash. They came back with thousands of pounds of garbage.

But their work didn't end there. When you're protecting one of the most pristine—and vulnerable—lakes in the world, it takes more than just filling garbage bags with trash and hauling it to the dump.

So these work groups, organized by the League to Save Lake Tahoe, brought the bags of refuse to a central location, spread it out on large tarps, and categorized it. They kept the cigarette filters separated from bottles and cans, and picked the pieces of plastic out of the piles of Styrofoam. Plastic grocery bags had their own space on the tarps.

The grim tally

The result? Not only did the groups learn they removed 3,350 pounds of trash, they also found they had collected 10,650 cigarette butts. Add those figures to the precise counts of Styrofoam, bottles, cans, and discarded grocery bags and you have data that public agencies and organizations can use to craft better litter-reduction and outreach campaigns, and to support such local ordinances as South Lake Tahoe's decision to scrap single-use plastic bags at grocery stores in favor of reusable bags.

"It was inspiring to see so many people, visitors and locals alike, come together to take care of Lake Tahoe," said Marilee Movius, the League's community engagement manager. "During the cleanups, volunteers collected mostly plastic trash, which will never biodegrade. Removing it is extremely beneficial for the Lake, the wildlife, and us."

The League, the Lake Tahoe Visitors Authority, and the City of South Lake Tahoe will continue to host beach



Volunteers pause for a group picture after removing hundreds of pounds of trash from Tahoe beaches last summer.

cleanups around the Lake this summer, paying special attention to times of heavy use, such as Independence Day celebrations.

Eyes on the Lake

For many visitors to Tahoe, engagement in the Region's effort to address threats from aquatic invasive species may start and stop with the experience of getting their boats inspected—and, if needed, decontaminated—for invasives. Inspections are a critical part of Tahoe's plan to prevent new non-native species from getting a foothold in the Lake. But what about the invasives that have already made their way in? To keep eradication and control costs from skyrocketing, it's crucial that we identify unreported infestations while they are still small and easier to control.

In 2014, the League's Eyes on the Lake program trained more than 80 visitors and locals to identify the two most common non-native aquatic plants: curlyleaf pondweed and Eurasian watermilfoil. The program gives people the skills needed to spot new shoreline

infestations while they're out boating, swimming, fishing, paddling on their standup paddleboards, or lounging on the beach.

"The Eyes on the Lake program takes advantage of the huge numbers of visitors and locals enjoying the Lake," said Darcie Goodman Collins, the League's executive director. "People out having fun in their boat or on the beach get to help address one of Lake Tahoe's most serious threats. You can truly 'protect while you play.'"

Protect Lake Tahoe

Would you like to take part in a beach cleanup this summer or be trained to help spot aquatic invasive species? More beach cleanups and Eyes on the Lake trainings are being scheduled throughout the Region for this summer. Contact the League to Save Lake Tahoe at 530-541-5388 or at protect@keeptahoeblue.org, or visit keeptahoeblue.org/news/events to find the next cleanup or training near you.

Jesse Patterson is the deputy director of the League to Save Lake Tahoe.



The many colors of Tahoe

By David C. Antonucci

Everyone who visits Lake Tahoe marvels at its palette of water colors, especially its world-renowned deep-blue shade. Some have speculated that the azure color derives from a reflection of the blue sky or the presence of impurities. The answer is actually complex.

Tahoe's colors depend on such factors as the viewing angle, position of the sun, cloud cover, water depth, and the composition of the Lake bottom in shallow areas. Inherent to all these factors is the exceptional water clarity that allows sunlight to penetrate very deeply. It is true that to "Keep Tahoe Blue" we must keep Tahoe extraordinarily clear.

As sunlight penetrates the Lake, water molecules absorb the red, orange, yellow, green, and violet colors in the light spectrum as it passes through the shallow depths. This leaves only blue and indigo light at greater depths. Fine particles and water molecules cause scattering of the predominately blue and indigo light through the clear water back toward the eyes of an observer. Scientists call this phenomenon "backscatter."

The deepest part of the Lake is often described as "cobalt blue," as blue light is absorbed further, leaving mostly indigo.

In the nearshore, the water can have an emerald hue because green light is the predominant light color at these depths. The shallow depth and a higher concentration of particles prevent the sunlight from traveling long enough to develop its blue color. In water of a few feet, there is no distinct coloration, and we see only the color of light reflected off of the Lake bottom.

Under the right conditions, the Lake surface can reflect an image of the sky and adjacent mountains. Other times, it can exhibit the refracted colored light from a sunrise or sunset bouncing off the cloud cover.

David C. Antonucci's booklet "The Natural World of Lake Tahoe" explains the natural history and natural science of Lake Tahoe.

'Take Care' campaign serves as reminder

Ads take aim at small mistakes that can have big consequences

By Devin Middlebrook

TAHOE REGIONAL PLANNING AGENCY

A new ad campaign at Lake Tahoe is taking aim at the issues of litter, dog waste, fire safety, bear awareness, and aquatic invasive species prevention.

The "Take Care" campaign, the first regional effort to address these issues, sports humorous headlines and playful characters in a series of reminders that poke fun at the mistakes we all make when we're not paying attention.

The result of extensive research with more than 60 public and private leaders from the community, Take Care provides a unified message that can be used to promote more sustainable actions in the Tahoe Region.

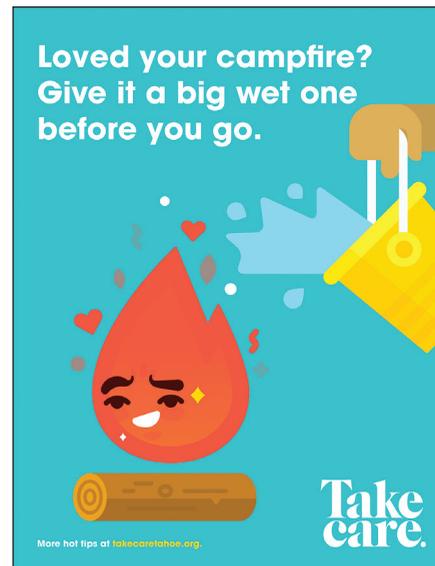
The creative team of Meg Siegal and Nate Laver, who worked on the award-winning "truth" anti-smoking campaign, developed the strategy and campaign for Take Care.

"The power of 'truth' was convincing people that smoking wasn't cool," said Siegal, creative director for the campaign. "The power of Take Care is that through a fun and unique approach we are going to convince people that taking care of the Tahoe Region is cool."

According to its website takecaretahoe.org, the campaign is "meant to inspire everyone, from the young and the old, to residents and visitors, to be more responsible when living, working, or playing in this mountain treasure."

The campaign has already been adopted by a number of public agencies, private businesses, and nonprofit organizations around the Region. Groups and businesses are encouraged to use the images and messages in the campaign in conjunction with their own communication efforts.

"The campaign is really fun and so different than what we normally use," said Madonna Dunbar of the Incline Village General Improvement District and the Tahoe Water Suppliers Association. "We are excited to join the regional effort by using the Take Care campaign to help keep our beaches, parks and trails clean."



The Take Care campaign uses playful characters and funny headlines to raise awareness.

Take Care was developed by the Lake Tahoe Outreach Committee, which is comprised of the Lake Tahoe Sustainability Collaborative, Tahoe Fund, Tahoe Regional Planning Agency, Tahoe Resource Conservation District, League to Save Lake Tahoe, and UC Davis Tahoe Environmental Research Center.

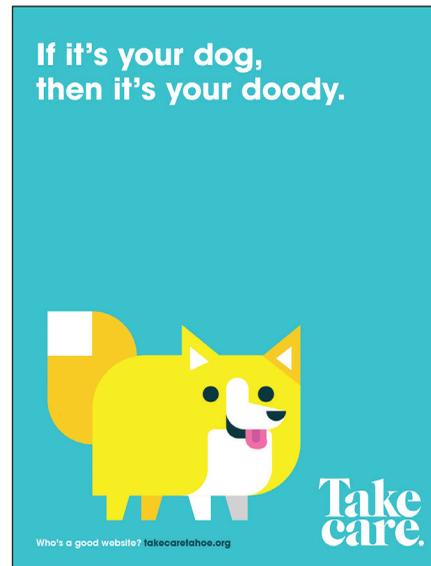
The development of Take Care was funded by the Tahoe Fund, Martis Fund, Barton Health, and Tahoe Regional Planning Agency.

The campaign is the result of several months of collaboration after a workshop in September 2013 that bought together more than 60 regional stakeholders, said Amy Berry, Tahoe Fund CEO and member of the Lake Tahoe Outreach Committee.

"We heard loud and clear that a unified stewardship brand was needed to bring the Region together to elevate our messages and see the biggest impact," Berry said. "We are thrilled to finally make the materials available to our regional partners."

One of the panels in the ad depicts a cigarette butt on a lounge chair at the beach. The message reads, "Nobody wants to see your dirty butt."

The message reflects the results of a trash cleanup effort in which volunteers



Take care.

collected more than 10,000 cigarette butts from Tahoe beaches.

"We picked up more than 3,300 pounds of litter from just six beaches after last year's July Fourth holiday," said Jesse Patterson, deputy director of the League to Save Lake Tahoe and member of the Lake Tahoe Outreach Committee. "It is our hope that the community will adopt this new campaign in time to see a dramatic difference this year."

Campaign materials and images—along with a guide for how to use them—are available to Tahoe organizations who want to incorporate Take Care in their own outreach materials, including trash cans, trails, piers, restaurants, or beaches. This toolkit for adopting, downloading, and sponsoring the campaign is available free at takecaretahoe.org.

Devin Middlebrook is an environmental education specialist with the Tahoe Regional Planning Agency.



A bear-proof food locker.

Proper food and trash storage helps keep Tahoe bears safe

By Lisa Herron

U.S. FOREST SERVICE

State and federal land managers are reminding Lake Tahoe residents and visitors to take special precautions this summer to discourage bears from approaching homes and campsites.

It is illegal to feed bears in California and Nevada, and last year, the U.S. Forest Service issued a Forest Order that requires campers to properly store food and dispose of trash at Fallen Leaf and Meeks Bay campgrounds and Meeks Bay Resort.

This year, the Forest Service, with support from the California Department of Fish and Wildlife and the Nevada Department of Wildlife, is working to expand and enforce the Forest Order on all National Forest System lands in the Lake Tahoe Basin.

Bears have a keen sense of smell and are attracted to human food sources, including pet food, bird feeders, toiletries, and trash. When bears obtain access to human food sources, they lose their fear of humans and can cause property damage and threaten public safety. If they continue to pose a threat to humans, they may be killed by wildlife officials.

Campers should keep a clean campsite and always store food (including pet food), canned or bottled drinks, toiletries, coolers, dishes, and other scented items in food storage lockers. Trash should be disposed of in bear-resistant trash containers and dumpsters.

At cabins and homes, residents should clean outdoor grills, secure windows and doors, and remove all food, trash, and toiletries when leaving the residence for an extended period of time. Do not leave pet food or bird feeders outside.

For more information on living in and visiting bear habitat, visit www.wildlife.ca.gov/Keep-Me-Wild/Bear.

Lisa Herron is a public affairs specialist with the U.S. Forest Service Lake Tahoe Basin Management Unit.

Lake Spirit Award winners announced

One works with high school students on environmental education while another works to set up composting programs in elementary schools. One group dives into the chilly Lake to remove aquatic invasive plants, while another individual works to encourage conservation efforts and reaches 200,000 people a year.

They are the 2014 winners of the annual Lake Spirit Awards, given each year by TRPA to citizens and agency representatives who show exceptional commitment to Tahoe.

Exemplary citizens:

Rebecca Bryson is a member of the Community Mobility Working Group, which advocates for improved community connections. She is instrumental in the construction of key alternative transportation options along the South Shore. Bryson also spearheaded a composting program in Lake Tahoe Unified School District elementary schools and was the lead organizer for the Sierra House Growing Domes project, generating over \$100,000 in funding for its construction.

The Murphy family, consisting of Shawn, Angie, Tyler, and Savannah, are committed to fighting aquatic invasive species in Lake Tahoe. Through their business, Wet Leprechaun Dive Services, the Murphys have helped physically remove aquatic invasive weeds from iconic Tahoe locations, including Emerald Bay. The Murphy family also champions public education about aquatic invasive species in an effort to grow awareness of this threat to Lake Tahoe.

Exemplary agency representative or environmental scientist:

Joy Barney of the U.S. Forest Service Lake Tahoe Basin Management Unit founded the Generation Green of Lake Tahoe Program, which educates high school students about the environment and gives them work and volunteer experience through the Forest Service. She helped found the South Tahoe Environmental Education Coalition, providing 1,500 hours of environmental education in local schools annually.

Madonna Dunbar of the Incline Village General Improvement District (IVGID) and Tahoe Water Suppliers Association promotes environmental programs in Incline Village and around the Region. Her work on the IVGID Waste Not Program reaches over 200,000 people every year. She promotes water conservation and encourages people to Drink Tahoe Tap.

Sustainability Plan earns national award

Collaborative effort addresses climate change, economic vitality

By Jim Sloan

TAHOE IN DEPTH

Tahoe Regional Planning Agency's Lake Tahoe Sustainability Action Plan was recognized with a National Planning Achievement Award for Environmental Planning from the American Planning Association (APA). The Sustainability Action Plan is among 12 plans nationwide recognized for planning excellence during the APA's National Planning Conference April 20 in Seattle.

The Plan is one of the first to take a regional approach to sustainability. Major components of the plan include:

- Greenhouse Gas (GHG) Reduction Plan with regional baseline inventories and projected emissions, a GHG reduction target, and quantification of reduction measure effectiveness.
- Climate Change Adaptation Plan that identifies measures to enhance the Region's resiliency when faced with many climate change effects.
- Sustainability Actions for water quality, water supply, wildfire and flood protection, air quality, job generation, economic activity, energy supply, mobility, goods movement, waste management, social equity, community noise, recreation resources, and public health.

"Lake Tahoe is leading the way in planning to improve sustainability and adapt to climate change. We have an award-winning blueprint to do that collaboratively here at Lake Tahoe and a model for other communities and regions to emulate," said Joanne S. Marchetta, executive director of TRPA.

TRPA created the Sustainability Action Plan with many partners, including El Dorado and Placer counties, City of South Lake Tahoe, California Tahoe Conservancy, the North Lake Tahoe Resort Association, and the Sierra Nevada Alliance. A grant from the California Strategic Growth Council paid for the plan, which includes implementation steps for residents, businesses, visitors,



TRPA and Ascent Environmental staff receiving the National Planning Achievement Award at the American Planning Association's National Planning Conference in Seattle included from left to right: Honey Walters, Ascent Environmental; John Hester, TRPA; Karin Edwards, TRPA; Poonam Boparai, Ascent Environmental.

schools, and governments to rebalance the Lake Tahoe Region's environment, economy, and community health while also confronting the impacts of climate change.

"Creating a resilient and sustainable Lake Tahoe Region will only be successful if we partner with local jurisdictions, public land owners, private interests, and the community at large. The Sustainability Action Plan sets the foundation and framework to create a more sustainable Lake Tahoe Region," said Karin Edwards, Sustainable Communities program manager at TRPA.

The sustainability actions are a mix of new and old ideas. The plan calls for a 15 percent reduction in greenhouse gas emissions by 2020. About 7 percent of that target is addressed through land-use and transportation strategies of the Regional Plan. The Sustainability Action Plan includes strategies to reach the overall goal of reducing emissions by 15 percent, including strategies to decrease electricity and natural gas consumption. The plan also addresses economic vitality and natural disaster mitigation.

The Lake Tahoe Sustainability Collaborative has been and will

continue as a vital partner.

"We appreciated the opportunity for a 'bottom up' participation in crafting the Lake Tahoe Sustainability Action Plan," said Michael Ward, of the Lake Tahoe Sustainability Collaborative.

Honey Walters, principal at Ascent Environmental, the consultant who helped craft the Sustainability Action Plan, said it provides a toolkit to meet greenhouse gas reduction goals as well as recommendations for adapting to the Earth's changing climate, "thus serving as a template for future planning across the globe."

More information about the Lake Tahoe Sustainability Action Plan and steps community members can take to improve the Lake Tahoe Region's sustainability are available online at Itscp.org/sustainability-action-plan/.

Tracking progress on meeting the goals is key. The Sustainability Dashboard is a resource to report regional progress on 28 indicators measuring the economic, community, and environmental health of the Lake Tahoe Region. Visit laketahoeinfo.org for more information.

Bi-state park offers a quick getaway

Van Sickle offers access to Tahoe Rim Trail as well as a glimpse of history

By Victoria Ortiz

Hikers on the South Shore looking for quick access to the forest as well as a glimpse of the Region's history might find what they are looking for at Van Sickle Bi-State Park.

The park, which opened in 2011, is located just a few minutes' walk from the casino core, behind Harrah's and Mont Bleu. Now visitors to the park can download a trail map with mileage markers and points of interest from www.tahoe.ca.gov.

The park makes the ideal spot to appease the hiker, the history buff, and the serial Instagrammer in your group. It offers extraordinary views of Lake Tahoe, miles of hiking and biking trails, and historic cabins and a barn that highlight the land's cultural heritage.

Jack Van Sickle fulfilled his dream of memorializing his grandfather, Henry Van Sickle, when he donated land to Nevada Division of State Parks.

The California Tahoe Conservancy purchased an adjacent 156 acres on the California side in 2001 and the Bi-State Park opened its gates in summer 2011. The park serves as a gateway to the Tahoe Rim Trail for those seeking a longer day, and includes restrooms and picnic sites for people who want to relax among the pines.

The City of South Lake Tahoe's visitor center, Explore Tahoe: An Urban Trailhead, located in Heavenly Village, teaches people about Lake Tahoe's natural and recreational features and sends many day-hikers to Van Sickle.

"Van Sickle has proven to be a favorite among visitors seeking to explore Tahoe. The opportunity to access beautiful vistas without having to drive a car or get on a bus is a bonus for both visitors and the environment," said Lauren Thomaselli, recreation manager for the City of South Lake Tahoe.

This free park is open year-round

to pedestrians from sunrise to sunset. The gates are open and limited parking is available to vehicles from May 1-October 31, weather permitting.

The park is also featured on the Sierra Nevada Geotourism MapGuide Project (www.sierranevadageotourism.org/content/van-sickle-bi-state-park). The Sierra Nevada Conservancy and Sierra Business Council have partnered with the National Geographic Society to feature the history and heritage of the Sierra Nevada Region through this interactive website.

According to that site, the California portion holds the historic buildings of the Van Sickle Equestrian Complex, including the 1860s hay barn Henry Van Sickle built in the 1860s, a 100-year-old log cabin, and housekeeping cabins from the former Three Pines Motel that were moved to the site in 1960. The Van Sickle family then operated the Stateline Stables on the site until 1993.

Marsolais named new Forest Supervisor

Jeff Marsolais has been promoted to Forest Supervisor for the U.S. Forest Service's Lake Tahoe Basin Management Unit, replacing Nancy Gibson, who retired earlier this year.

Marsolais, the deputy forest supervisor for three years, takes over what he considers to be one of the best assignments in the Forest Service.

"The Basin is really a special place," he said. "People wait their whole careers to get this assignment."



Jeff Marsolais

Although the National Forest System lands in the Basin are small by National Forest standards, Marsolais noted that they pose special challenges. The recreational value of the federal land is high, its use by people is high, and its proximity to many jurisdictions makes cooperation extremely important. He noted that a recent monitoring effort showed that the lands accommodate close to 5 million visits annually – making it one of the most popular in the country.

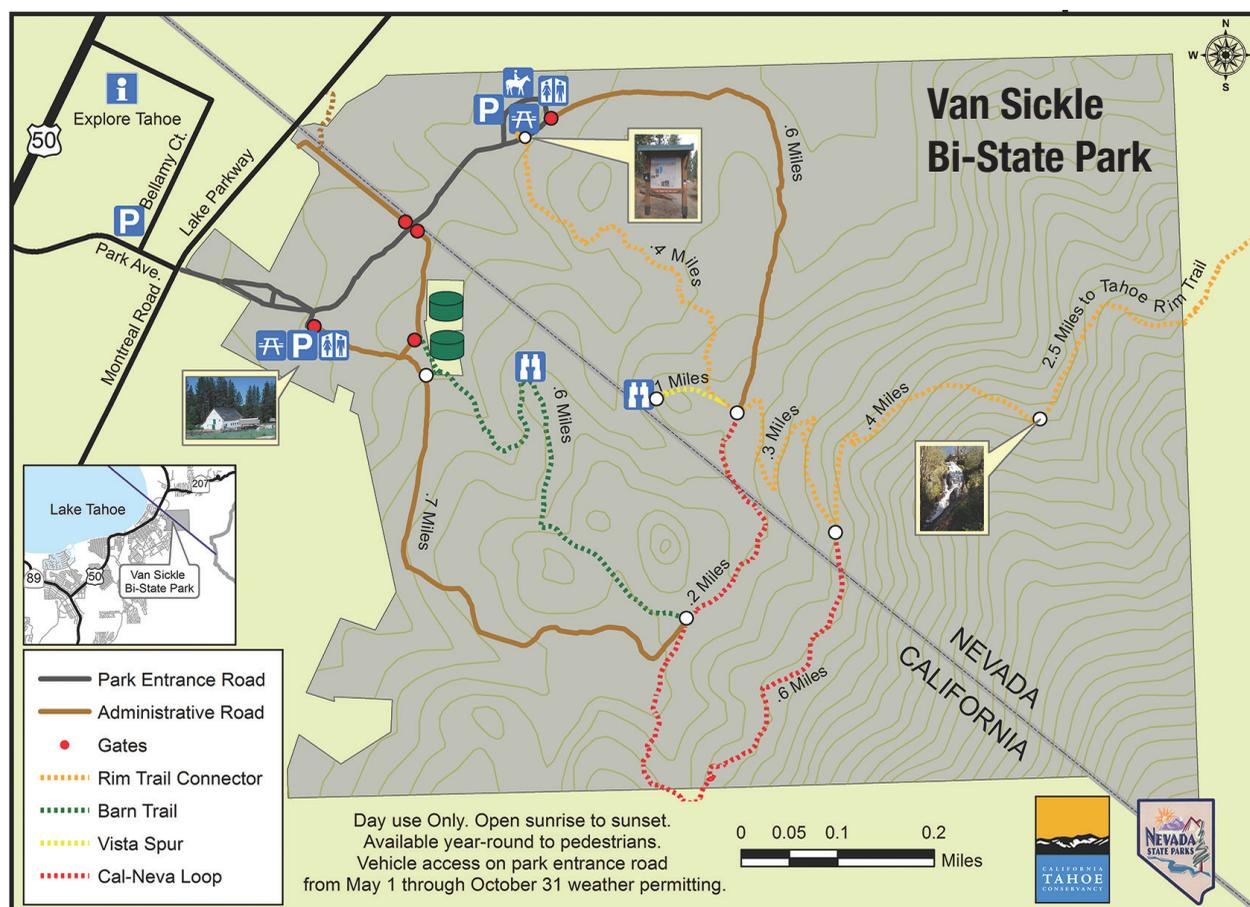
"That's a high amount of use for a small amount of acreage," Marsolais noted. "The challenges of heavy recreation use creates opportunities for us to discuss sustainable recreation and how that fits in with sustainable communities. We are in regular dialogue with many different people and many different groups."

Although the Basin is carefully monitored by different agencies and municipalities, Marsolais said he sees very little conflict.

"A lot of folks are working together to make positive ecosystem change," he said. "No one agency can do that. The close collaboration at the highest levels here in the Basin is what makes Tahoe so different."

"Many of the people I work with are recognized experts in their field," he said.

Marsolais has worked for the Forest Service in seven different national forests since the mid-1990s. Prior to that, he worked for the BLM. He has bachelor's and master's degrees from Humboldt State University.



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This issue's winner

Congratulations to **Monica Hill** of Incline Village, our latest subscriber winner!

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If you are interested in becoming an underwriter, please contact Sarah Underhill, design and project manager at the Tahoe Regional Planning Agency, at 775-589-5211 or sunderhill@trpa.org.

What readers are saying:

I have just spent time reading the winter and summer publications. As a half-year resident I appreciate the update about a number of issues that confront Tahoe. I found the articles informative and helpful. Good work!
R.R.—via email

We are long time owners of property in Marla Bay and are very impressed with the latest issue of Tahoe In Depth.
L.C.—Oakland, CA

Thanks for a valuable perspective and positive look at the efforts of TRPA and all of the partners that help create a healthy future for our beloved environment.
L.M.—South Lake Tahoe, CA

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WILDFIRE IS INEVITABLE. DISASTER IS PREVENTABLE.



Fire is a natural part of the Tahoe Basin. But being ready for a wildfire takes effort.

Rake your needles. Thin your shrubs. Prune your trees. These simple actions can prepare your home and your neighborhood for the next wildfire. Your neighbors are counting on you! To request a free, personalized defensible space inspection from your local fire professional, visit: livingwithfire.info/tahoe.

This Wildfire Prevention message is brought to you by the Tahoe Fire and Fuels Team in cooperation with the USDA Forest Service. The USDA Forest Service is an equal opportunity provider and employer.



livingwithfire.info/tahoe



Forest Service crew member tags native mussel during the relocation project.

Biologists transplanting native mussels as part of river-rerouting project

By Lisa Herron

U.S. FOREST SERVICE

Having to move in a hurry is never fun, but the U.S. Forest Service and its partners recently launched an effort to make relocation a little easier for the Lake Tahoe Basin's largest remaining population of native Western pearlshell mussels.

Western pearlshell mussels, which can live up to 70 years, once were numerous in the Upper Truckee Watershed. The species is declining due to pollution, channel alteration, siltation, and the decline of native fish populations.

"Unlike quagga mussels, these native mussels belong here in the Truckee River, and we anticipate (this project) will improve their habitat," said U.S. Forest Service aquatic biologist Sarah Muskopf. "Our goal is to figure out how to help them survive."

The Forest Service will be rerouting a stretch of the Upper Truckee River where the mussels currently reside as part of a project to reduce erosion and restore wet meadow and aquatic habitat.

The Forest Service-California Tahoe Conservancy portion of the Upper Truckee River restoration will dewater and fill in a 7,400-foot section of the river that contains about 12,000 mussels.

Last summer, aquatic biologists measured, tagged, and moved more than 1,000 mussels before transporting them to 36 different test plots and five control plots.

The scientists have monitored the transplanted mussels to see how well they thrive in their new homes. The results will be used to determine where the remaining mussels will be placed when it comes time to move them this summer and next.

Partners include The Nature Conservancy, Tahoe Regional Planning Agency, California Department of Fish and Wildlife, University of Nevada, Reno, and California Tahoe Conservancy.

Vikingsholm gets a little TLC



"Vikingsholm" by Edward licensed under CC by 2.0 (<https://creativecommons.org/licenses/by/2.0/>)

Vikingsholm emerges from the shoreline forest at the head of Emerald Bay. Anyone interested in helping with the maintenance and restoration of Vikingsholm can donate to the Vikingsholm Project—a fund set up to supplement state funds from the California State Parks system. For more info contact: California State Parks Foundation, 50 Francisco Street, Suite 110, San Francisco, CA 94133 or www.vikingsholm.com/foundation.html

Rugged, majestic home in Emerald Bay renovated through donations

By Jim Sloan

TAHOE IN DEPTH

Vikingsholm, with its thick beams and natural-rock exterior, looks like it was built to withstand an attack from, well, Scandinavian, seaborne raiders.

But despite its stout, granite-boulder exterior and its massive, hand-hewn interior timbers, the popular tourist destination at Emerald Bay is in need of repairs. Some of its wiring needs to be replaced, its leaky sod roof needs to be refurbished, and some of its wooden features – including spikes along its eaves and dragons' heads on the roof peaks – need to be spruced up.

Vikingsholm draws a stream of tourists throughout the summer. Visitors park in the small lot off Highway 89 and hike a mile down a sandy trail to the

home and park grounds that surround it. Visitors are free to roam around the stone structure and take in the exterior courtyard, and tours of the interior are also offered throughout day.

Vikingsholm, built in 1929, is actually one of Tahoe's first truly "green" structures. It has a sod roof planted with wildflowers, and much of the timber and granite used for building came from the surrounding land. The craftsmen who built it lived on site during construction.

The home was the brainchild of Mrs. Lora Knight, who bought the land at the head of the bay, including Fannette Island just off shore, for \$250,000 in 1928. The surrounding steep hillsides plunging into Emerald Bay reminded Knight of a fjord, so she decided to build

a home with Scandinavian influences.

Knight spent 15 summers at the estate, dying there in 1945. Six years later, the home was donated to the state.

Since the state budget doesn't cover all the necessary repairs to Vikingsholm, private nonprofits have stepped in to help. According to the Sierra State Parks Foundation and the California State Parks Foundation—two groups that have helped foot the bill for repairs at Vikingsholm—the new sod roof that's needed over the servants quarters at the estate will cost \$90,000 and the new wiring that's needed will cost \$60,000. The two groups will pay most of those costs. Over the past 20 years, the California State Parks Foundation has helped raise about \$2 million to maintain Vikingsholm.